REMARKS

The present application is believed to be in condition for allowance at the time of the next Official Action.

Claims 1-3, 5-8, 13-15 and 17-24 are pending.

Claims 7 and 8 are withdrawn from consideration.

The Official Action rejected claim 6 under 35 USC §112, second paragraph, as being indefinite. Applicants respectfully disagree.

The Official Action stated that dependent claim 6 is indefinite for reciting a filler material when the independent claim 1 does not require the presence of a filler material. However, claim 1 is not limited to 0% filler. Claim 1 recites 0-50% filler material. Thus, as filler materials are within the scope of claim 1, claim 6 does further limit the independent claim.

Therefore, claim 6 is definite, and applicants respectfully request that the rejection be withdrawn.

Claims 1 and 2 were rejected under 35 USC §102(b) as being anticipated by RAJALINGAM et al. 6,271,305 (RAJALINGAM). Applicants respectfully disagree.

RAJALINGAM does not disclose each and every element as set forth in claim 1 and claim 2 with sufficient specificity in order to anticipate the claims.

Claim 1 is directed to a prefabricated sealing membrane including a thermoplastic polyurethane obtained from a diisocyanate with a functionality substantially equal to 2, a polyol with a functionality substantially equal to 2 and a chain elongation agent. The polyurethane molecules are free of double carbon-carbon bonds, and the polyols are free of ethylene linkages. Claim 1 further recites that the resulting modified bituminous binder is adapted to be softened by reheating and recover its properties after subsequent cooling.

RAJALINGAM is directed to fluid bituminous polyurethane compositions as coatings and sealing materials for roofs. RAJALINGAM discloses a polyurethane polymer formed using a catalyst and a curing agent, isocyanate of a functionality of 2 or more in some examples, and a polyol of a functionality equal to 2 in other examples.

RAJALINGAM fails to disclose at least four recited features: (i) an elongation agent, (ii) polyurethane molecules free of double carbon-carbon bonds, (iii) polyols free of ethylene linkages, and (iv)a modified bituminous binder adapted to be softened by reheating and recover its properties after subsequent cooling. RAJALINGAM even fails to disclose a manner of production, packaging or use of the composition that would suggest the composition inherently has these features.

As to feature (i), the Official Action considered catalysts and curing agents of RAJALINGAM to meet the recited

chain elongation agents. However, applicants respectfully submit that the catalysts and curing agents are not chain elongation agents. These catalysts and curing agents, or cross-linking agents, are added to control reaction kinetics (i.e. as disclosed in the Abstract), by affecting the gelation time and induction time (see the discussion of Figure 3 and columns 6 and 7). RAJALINGAM even discloses that the curing agents, at high concentrations, may interfere with the formation of high molecular weight polymers(column 7, lines 35-37). Thus, RAJALINGAM fails to disclose chain elongation agents.

The Official Action does not address features (ii), (iii) or (iv). However, RAJALINGAM does not consider polyols free from any ethylene linkage, nor of polyurethane molecules free from carbon-carbon double bonds. There is also no discussion in RAJALINGAM of the thermoplasticity being such that it recovers all the properties after softening by heating and then subsequently cooling.

Thus, although RAJALINGAM discloses an example of polyol with a functionality equal to 2 (column 6, line 13) and examples of isocyanates having a "two or more" functionality (column 6, line 25), there is no specific teaching of a diisocyanate and a polyol having a functionality substantially equal to 2, along with an elongation agent to form a polyurethane without carbon-carbon double bonds and polyols without ethylene linkages so as to provide the recited thermoplasticity.

As further evidence that the recited features are not inherently present in the composition of RAJALINGAM, RAJALINGAM does not share the production, the packaging or the use of the resulting composition as the present invention. The bituminous/polyurethane compositions of RAJALINGAM are made at the workplace, by in situ mixture of polyols with isocyanates or polyisocyanates in the bituminous mass. The coating is then formed by a projection of the composition on the support to be covered. It is thus necessary to have a heavy movable installation at the workplace.

The present invention is a prefabricated membrane, as recited in claim 1. That is, the membrane is made in a factory and provided in the form of a final product to its place of use. Its manner of application (unrolling, cutting, softening with a blowtorch) is simple and requires no equipment or heavy material. Thus, even the manner of the production, packaging and use of the present invention further distinguishes the recited prefabricated membrane of claim 1 from the composition described in RAJALINGAM.

As to claim 2, RAJALINGAM discloses that the polyol/isocyanate ratio to bitumen is preferably 50/50 (column 9, lines 28 and 29) and that the polyol is present in the composition between 40 and 72% by weight (claim 6). Thus, the polyurethane is present with a weight percent always greater than

40%, whereas claim 2 recites 15% to 40% thermoplastic polyurethane.

Therefore, in view of the above, RAJALINGAM fails to disclose the recited features of claims 1 and 2 of the present invention with sufficient specificity for the finding of anticipation, and RAJALINGAM does anticipate claims 1 and 2. Applicants respectfully request that the rejection be withdrawn.

Claim 5 was rejected under 35 USC §103(a) as being unpatentable over RAJALINGAM. Applicants respectfully disagree.

The Official Action states that it would have been obvious to have a thermoplastic polyurethane having between 10 and 40% hard segments because the amount of hard segments and polyurethane directly affects the moldability and durability and the strength of the polyurethane.

However, applicants respectfully submit that the quantity of hard segments of the polyurethane molecules present has no influence on the thermoplasticity of the polyurethane: it is a matter of two separate and independent concepts. Rather, the quantity of hard segments corresponds to the quantity of isocyanate and the elongation of the chains present in the polyurethane polymer. The thermoplasticity corresponds to the fusible and soluble character of the polymer. The thermoplastic character is obtained by the selection of the polyols, of the isocyanates and of the chains lengtheners with a functionality substantially equal to 2.

Accordingly, RAJALINGAM alone fails to render obvious claim 5, and applicants respectfully request that the rejection be withdrawn.

Claims 3 and 6 were rejected under 35 USC §103(a) as being unpatentable over RAJALINGAM in view of TERRY et al. 5,981,010 (TERRY). Applicants respectfully disagree.

RAJALINGAM is relied on for teaching the composition as discussed above.

TERRY is offered for the teaching of various components of polyurethane modified bitumen coating compositions. However, regardless of the ability of TERRY to teach that for which it is offered, TERRY does not remedy the deficiencies of RAJALINGAM for reference purposes. TERRY fails to disclose or suggest a thermoplastic polyurethane made from a diisocyanate of a functionality substantially equal to 2, a polyol of a functionality substantially equal to 2, and a chain elongation agent, wherein the polyurethane molecules are free of double carbon-carbon bonds and the polyols are free of ethylene linkages.

Thus, the proposed combination of RAJALINGAM and TERRY does teach the composition of the independent claims, and the combination does not render obvious dependent claims 3 and 6.

Therefore, applicants respectfully request that the rejection be withdrawn.

Claims 13-15 and 17-24 were rejected under 35 USC §103(a) as being unpatentable over RAJALINGAM in view of LUCKE 4,871,792 (LUCKE). Applicants respectfully disagree.

RAJALINGAM is offered for the same reasons discussed above regarding claim 1. However, RAJALINGAM fails to disclose or suggest the features recited in independent claims 15 and 24: a thermoplastic polyurethane that is obtained from a polyol having a functionality between 1.95 and 2.05, an isocyanate having a functionality between 2.0 and 2.1, and a chain elongation agent, wherein the thermoplastic molecules are free of double carbon-carbon bonds and the polyols are free of ethylene linkages. RAJALINGAM also fails to the resulting modified bituminous thermoplastic binder is adapted to be softened by reheating and recover its properties after subsequent cooling, as recited in the independent claims.

LUCKE is offered for its teaching of a polyurethane modified bitumen composition that is suitable as a sealant. However, regardless of the ability of LUCKE to teach that for which it is offered, LUCKE fails to remedy the deficiencies of RAJALINGAM for reference purposes.

Like RAJALINGAM, LUCKE is also directed to a liquid composition and not to a prefabricated membrane, as recited in the present claims. Moreover, LUCKE indicates (column 8, lines 23-36) that this composition can be used as a cement (i.e. to cement insulating materials such as bituminous sheets), as

sealing materials adapted to fill joints or as coating compounds for enameled steel sheets (in the automotive field). However, LUCKE does not disclose that the composition may be used as a filling membrane, as recited in the present invention.

Indeed, the formulation of a composition disclosed by LUCKE is not even compatible with hot applications (column 3, lines 64-67), as is the present invention.

Thus, LUCKE not only fails to disclose or suggest the thermoplastic polyurethane features as recited in the independent claims, LUCKE also fails to suggest any properties that would result from a composition as recited in claims. As the combination of RAJALINGAM and LUCKE fails to teach the features of independent claims 1, 15, and 24, and the combination cannot render obvious these claims, or dependent claims 13-14 and 17-23.

Therefore, applicants respectfully request that the rejection be withdrawn.

In view of the above, applicants believe that the present application is in condition for allowance at the time of the next Official Action. Allowance and issue on that basis is respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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